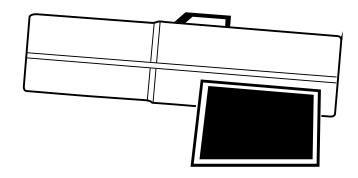


NATURAL GAS CONSTRUCTION HEATER OWNER'S MANUAL

For more information, visit www.desatech.com



Model BNG150T 150,000 Btu/Hr With Built-in Thermostat

IMPORTANT: Read and understand this manual before assembling, starting, or servicing heater. Improper use of heater can cause serious injury. Keep this manual for future reference.

A GENERAL HAZARD WARNING:

FAILURE TO COMPLY WITH THE PRECAUTIONS AND INSTRUCTIONS PROVIDED WITH THIS HEATER, CAN RESULT IN DEATH, SERIOUS BODILY INJURY AND PROPERTY LOSS OR DAMAGE FROM HAZARDS OF FIRE, EXPLOSION, BURN, ASPHYXIATION, CARBON MONOXIDE POISONING, AND/OR ELECTRICAL SHOCK.

ONLY PERSONS WHO CAN UNDERSTAND AND FOLLOW THE INSTRUCTIONS SHOULD USE OR SERVICE THIS HEATER.

IF YOU NEED ASSISTANCE OR HEATER INFORMATION SUCH AS AN INSTRUCTIONS MANUAL, LABELS, ETC. CONTACT THE MANUFACTURER.

TABLE OF CONTENTS

SAFETY INFORMATION	MAINTENANCE 5
PRODUCT IDENTIFICATION 3	SERVICE PROCEDURES
UNPACKING 3	ILLUSTRATED PARTS BREAKDOWN AND PARTS LIST 6
THEORY OF OPERATION	SPECIFICATIONS
NATURAL GAS SUPPLY	TECHNICAL SERVICE
VENTILATION 3	REPLACEMENT PARTS 8
INSTALLATION 4	WIRING DIAGRAMS
OPERATION 4	WARRANTY INFORMATIONBack Cover
STORAGE 5	



SAFETY INFORMATION



WARNINGS

A WARNING: FIRE, BURN, INHALATION, AND EX-PLOSION HAZARD. KEEP SOLID COMBUSTIBLES, SUCH AS BUILDING MATERIALS, PAPER OR CARD-BOARD, A SAFE DISTANCE AWAY FROM THE HEATER AS RECOMMENDED BY THE INSTRUC-TIONS. NEVER USE THE HEATER IN SPACES WHICH DO OR MAY CONTAIN VOLATILE OR AIRBORNE COMBUSTIBLES, OR PRODUCTS SUCH AS GASO-LINE, SOLVENTS, PAINTTHINNER, DUST PARTICLES OR UNKNOWN CHEMICALS.

WARNING: Not for home or recreational vehicle use.

The heater is designed for use as a construction heater. Certain standards govern the use of fuel gases and heating products for specific uses. Your local authority can advise you about these. The primary purpose of construction heaters is to provide temporary heating of buildings under construction, alteration or repair. Properly used, the heater provides safe economical heating. Products of combustion are vented into the area being heated.

We cannot foresee every use which may be made of our heaters. Check with your local fire safety authority if you have questions about heater use.

Carbon Monoxide Poisoning: Some people are more affected by carbon monoxide than others. Early signs of carbon monoxide poisoning resemble the flu, with headaches, dizziness, and/or nausea. If you have these signs, the heater may not be working properly. Get fresh air at once! Check for proper ventilation and have heater serviced.

Natural Gas: Natural gas has a distinctive odor. This odor helps you detect a natural gas leak. However, the odor may fade. Natural gas may be present even though no odor exists.

Make certain you read and understand all Warnings. Keep this manual for reference. It is your guide to safe and proper operation of this heater.

- Install and use heater with care. Follow all local ordinances and codes. In the absence of local ordinances and codes, refer to the National Fuel Gas Code Handbook, NFPA54/ANSI Z223.1 and the Natural Gas Installation Code, CAN/CGA B149.1. This instructs on the safe storage and handling of flammable gases.
- Use only the electrical voltage and frequency specified on model plate. The electrical connections and grounding of the heater shall follow the National Electric Code, ANSI/NFPA 70 or the Canadian Electrical Code, Part 1.

- Electrical grounding instructions This appliance is equipped with a three-prong (grounding) plug for your protection against shock hazard and should be plugged directly into a properly grounded three-prong receptacle or extension cord.
- Use only with natural gas. Do not attempt to use with propane/LP gas.
- Provide adequate ventilation. Before using heater, provide at least a three-square-foot opening of fresh, outside air for each 100,000 Btu/Hr of rating.
- This heater produces carbon monoxide, which is listed by the State of California as a reproductive toxin under Proposition 65.
- For indoor use only. Do not use heater outdoors.
- Keep heater away from strong drafts, wind, water spray, rain, or dripping water.
- Do not use heater in occupied dwellings or in living or sleeping quarters.
- Do not use heater in a basement or below ground level.
- Keep appliance area clear and free from combustible materials, gasoline, paint thinner, and other flammable vapors and liquids. Dust is combustible. Do not use heater in areas with high dust content.
- Minimum heater clearances from combustible materials: Sides: 2 Ft. Outlet: 8 Ft. Top: 6 Ft. Rear: 2 Ft.
- Check heater for damage before each use. Do not use a damaged heater.
- Check hose (if used) before each use of heater. If highly worn or cut, replace with hose specified by manufacturer before using heater.
- Do not alter heater. Keep heater in its original state.
- Do not use heater if altered.
- Locate heater on stable and level surface if heater is hot or operating.
- Never block air inlet (rear) or air outlet (front) of heater.
- Do not leave heater unattended.
- Keep children and animals away from heater.
- This heater is equipped with a thermostat. Heater may start at anytime.
- Never move, handle, or service a hot or operating heater. Severe burns may result. You must wait 15 minutes after turning
- To prevent injury, wear gloves when handling heater.
- Never attach duct work to heater.
- Turn off natural gas supply to heater and unplug heater when not in use.
- Use only original replacement parts. This heater must use design-specific parts. Do not substitute or use generic parts. Improper replacement parts could cause serious or fatal injuries.

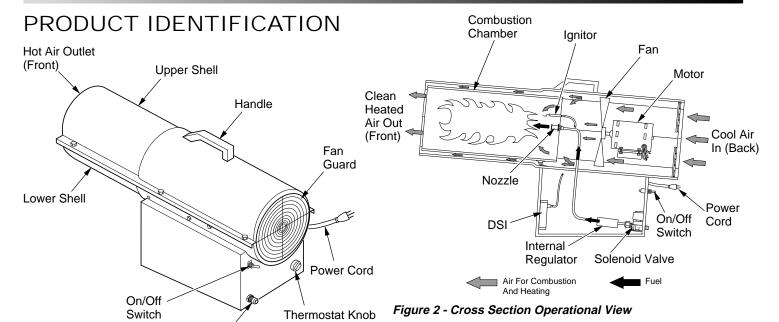


Figure 1 - 150,000 Btu/Hr Model

UNPACKING

1. Remove all packing items applied to heater for shipment. Keep plastic cover cap (attached to inlet connector) for storage.

Inlet Connector

- 2. Remove all items from carton.
- 3. Check all items for shipping damage. If heater is damaged, promptly inform dealer where you bought heater.
- 4. Hose not included. User must supply hose or flexible connector.

THEORY OF OPERATION

The Fuel System: The gas supply attaches to the heater by a minimum 3/4 inch i.d. hose or flexible connector. User must supply hose or flexible connector. The length should be no more than 10 feet long. The natural gas moves through the solenoid valve and the internal regulator and out the nozzle.

The Air System: The motor turns the fan. The fan pushes air into and around the combustion chamber. This air is heated and provides a stream of clean, hot air.

The Ignition System: The direct spark ignitor (DSI) sends voltage to the ignitor. The ignitor ignites the fuel and air mixture.

The Safety Control System: This system causes the heater to shut down if the flame goes out.

NATURAL GAS SUPPLY

The user must furnish the natural gas supply and the connections to the heater.

Regulate the natural gas supply down from a minimum 5 inches water column to a maximum of 1/2 psi. The natural gas supply capacity should be able to supply a minimum of 150 cubic feet of gas at pressure for each heater connected to the system.

Consult your natural gas supplier for proper sizing of the natural gas supply lines.

Follow all local ordinances and codes. In the absence of local ordinances and codes, refer to the *National Fuel Gas Code Handbook*, *NFPA54/ANSI Z223.1* and the *Natural gas Installation Code*, *CAN/CGA B149.1*.

VENTILATION

WARNING: Follow the minimum fresh, outside air ventilation requirements. If proper fresh, outside air ventilation is not provided, carbon monoxide poisoning can occur. Provide proper fresh, outside air ventilation before running heater.

Provide a fresh air opening of at least three square feet for each 100,000 Btu/Hr rating. Provide extra fresh air if more heaters are being used.



INSTALLATION

⚠ WARNING: Review and understand the warnings in the *Safety Information* section, page 2. They are needed to safely operate this heater. Follow all local codes when using this heater.

MARNING: Test all gas piping and connections for leaks after installing or servicing. Never use an open flame to check for a leak. Apply a mixture of liquid soap and water to all joints. Bubbles forming show a leak. Correct all leaks at once.

- 1. Provide natural gas supply system.
- 2. Install plumbing to a low pressure natural gas source. The source must be regulated to a maximum 1/2 psi. The plumbing must be a minimum 3/4 inch i.d. hose or flexible connector not over 10 feet long.
- 3. Connect the hose to the heater at the 1/2 inch SAE flare fitting at the inlet.
- 4. Open natural gas supply valve slowly.
- 5. Check all connections for leaks.
- 6. Close natural gas supply valve.

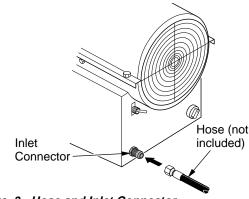


Figure 3 - Hose and Inlet Connector

OPERATION

WARNING: Review and understand the warnings in the *Safety Information* section, page 2. They are needed to safely operate this heater. Follow all local codes when using this heater.

TO START HEATER

- 1. Follow all installation, ventilation and safety information.
- 2. Locate heater on stable and level surface. Make sure strong drafts do not blow into front or rear of heater.
- Plug power cord of heater into a three-prong, grounded extension cord. Extension cord must be at least six feet long. Extension cord must be UL listed.

Extension Cord Size Requirement

Up to 50 feet long, use 18 AWG rated cord. 51 to 100 feet long, use 16 AWG rated cord. 101 to 200 feet long, use 14 AWG rated cord.

- 4. Plug extension cord into a 120 volt/60 hertz, three-hole, grounded outlet.
- 5. Open natural gas supply valve slowly.
- 6. Turn thermostat control knob fully counterclockwise to the "COOLER" position. Turn ON/OFF switch to the ON position. Turn thermostat control knob slowly clockwise until electric motor and fan begin to run. Heater will start in approximately 3 seconds. Adjust thermostat control knob to WARMER or COOLER setting as needed.

Note: If heater does not start after 3 seconds, the ignition control will automatically attempt to start heater one time. If heater fails to start on this attempt, the safety control will "lock out" and no further automatic restarts will be attempted. This could occur if air remains in fuel line. If heater fails to start on this attempt, turn ON/OFF switch to OFF position. Wait ten seconds for safety control to reset, then turn ON/OFF switch back to ON position and try to start heater again.

7. **Thermostat Operation Only:** During normal thermostat operation, heater will cycle off when air temperature rises to thermostat setting. When air temperature drops sufficiently below thermostat setting, the electric motor and fan will begin to run. After 15 to 60 seconds, heater burner should automatically ignite and provide heat to maintain temperature setting.

TO STOP HEATER

- 1. Tightly close natural gas supply valve.
- 2. Wait a few seconds. Heater will burn gas left in supply hoses.
- 3. Turn on/off switch to the OFF position.
- 4. Unplug heater.

STORAGE

A CAUTION: Disconnect heater from natural gas supply.

- 1. Place plastic cover cap over brass fitting on inlet connector.
- Store in dry, clean, and safe place. Do not store hose inside heater combustion chamber.
- When taking heater out of storage, always check inside of heater. Insects and small animals may place foreign objects in heater. Keep inside of heater free from combustible and foreign objects.

MAINTENANCE

WARNING: Never service heater while it is plugged in, connected to gas supply, operating, or hot. Severe burns and electrical shock can occur.

- 1. Keep heater clean. Clean heater annually or as needed to remove dust and debris. If heater is dirty or dusty, clean heater with a damp cloth.
- 2. Inspect heater before each use. Check connections for leaks. Apply mixture of liquid soap and water to connections. Bubbles forming show a leak. Correct all leaks at once.
- 3. Have heater inspected yearly by a qualified service agency.
- 4. Keep inside of heater free from combustible and foreign objects.

SERVICE PROCEDURES

WARNING: Never service heater while it is plugged in, connected to gas supply, operating, or hot. Severe burns and electrical shock can occur.

UPPER SHELL REMOVAL

- 1. Remove screws along each side of heater using 5/16" nut-driver. These screws attach upper and lower shells together.
- 2. Lift or slide upper shell off.
- 3. Remove fan guard.



FAN

IMPORTANT: Remove fan from motor shaft before removing motor from heater. The weight of the motor resting on the fan could damage the fan pitch.

- 1. Remove upper shell (see column 1).
- Use 1/8" hex wrench to loosen setscrew which holds fan to motor shaft.
- 3. Slip fan off motor shaft.
- 4. Clean fan using soft cloth moistened with kerosene or solvent.
- 5. Dry fan thoroughly.
- 6. Replace fan on motor shaft. Make sure setscrew is touching back of flat surface on motor shaft (see Figure 6).
- 7. Place setscrew on flat of shaft. Tighten setscrew firmly (40-50 inch-pounds).
- 8. Replace fan guard and upper shell.

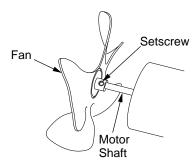


Figure 5 - Fan, Motor Shaft, and Setscrew Location

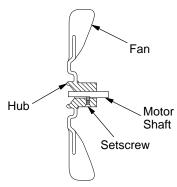
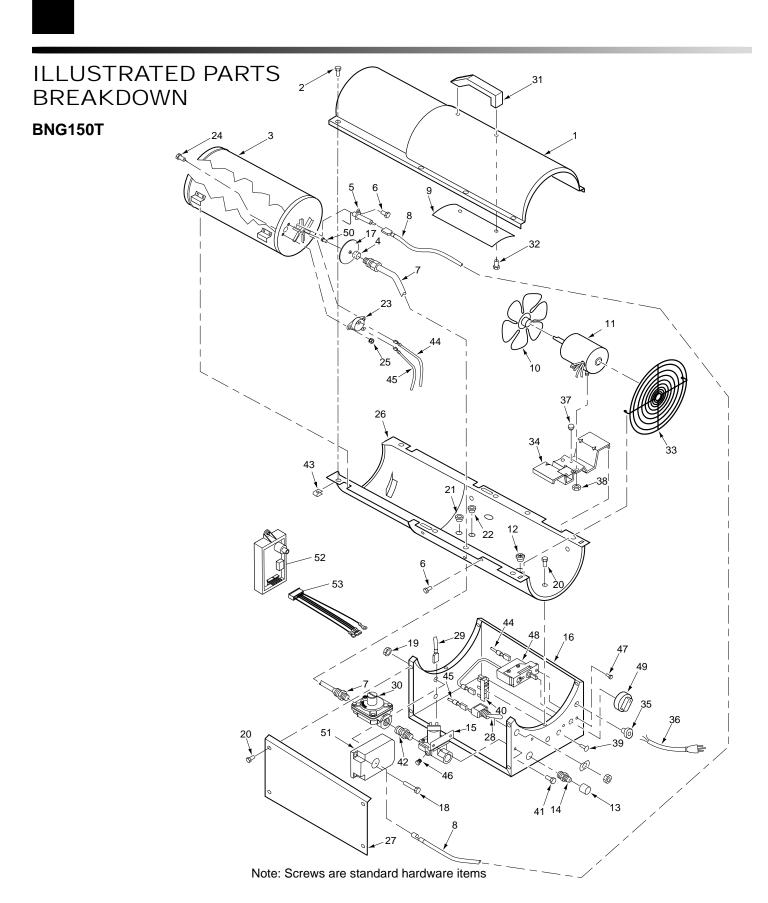


Figure 6 - Fan Cross Section

IGNITOR

1. Make sure gap between ignitor electrode and burner nozzle is .13/.15". Access ignitor electrode from inside combustion chamber. No other maintenance is needed for ignitor.





PARTS LIST

This list contains replaceable parts used in your heater. When ordering parts, follow the instructions listed under Replacement Parts on page 8 of this manual.

BNG150T

KEY NO.	PART NUMBER	DESCRIPTION	QTY.	KEY NO.	PART NUMBER	DESCRIPTION	QTY.	
1	098511-114	Upper Shell	1	33	097964-03AA	Fan Guard	1	
2	100647-01	Screw, #10-16 x 1/2"	8	34	101206-01	Motor & Relay Support Brkt Assy	1	
3	098512-53	Combustion Chamber Kit	1	35	M11143-1	Strain Relief Bushing	1	
4	103891-01	Nozzle	i	36	098219-17	Power Cord	1	
5	103934-01	Ignitor		37	M50631	Rubber Bumper	2	
6	M11084-38	Screw, #8-18 x 3/8"	2	38	NTC-4C	Lock Nut	2	
7	099334-03	Fuel Tube Kit	1	39	099157-01	Break Mandrell Rivet, 3/16"	1	
8	097806-02	Ignitor Cable	i	40	099125-01	Terminal Board	1	
9	M51108-01	Heat Shield	i	41	M12461-25	Screw, #10-32 x 1/4"	2	
10	M51153-01	Fan	i	42	103407-01	Fitting, Union 1/2 NPT to 1/2 NPT	1	
11	103404-01	Motor	i	43	M11271-8	Clip Nut	8	
12	097776-01	Universal Bushing	1	44	101480-10	High Temperature Wire Assy	1	
13	078978-01	Sleeve Cap	1	45	101480-11	High Temperature Wire Assy	1	
14	103401-01	Male Connector	1	46	098276-01	Plug 1/8 NPTF Hex	1	
15	103403-01	Solenoid Valve	1	47	M10908-1	Screw Hex TPG "F" 6-32 x .25	2	
16	097966-12AA	Base	1	48	097657-03	Built-in Thermostat	1	
17	078896-02	Washer, Baffle	1	49	104905-01	Thermostat Knob	1	
18	M12461-7	Screw, #6-32 x 1"	2	50	103400-02	Screw, Baffle	1	
19	099432-01	Hex Nut, #6-32	2	51	M51605-02	DSI Control No. 2003-19	1	
20	M11084-27	Screw, #10-16 x 1/2"	10	52	M51605-05	DSI Control No. 2003-45	1	
21	M50104-05	Shorty Bushing	1	53	110267-01	DSI Wire Harness (2003-45 Only)	1	
22	M50104-01	Shorty Bushing	1	` ''				
23	101481-05	Thermal Limit Switch	1	PARTS AVAILABLE—NOT SHOWN				
24	097968-05	Screw, #4-40 x 1/2"	2		M16841-20	Wire Assembly (2003-45 Only)	1	
25	097384-04	Hex Nut, #4-40 Captive Washer	2		103402-03	Wiring Decal (2003-45 Only)	1	
26	098511-129	Lower Shell	1		103402-01	Wiring Decal (2003-19 Only)	1	
27	097965-02AA		1		079231-01	Service Center List	1	
28	098226-01	On/Off Switch	1		097940-09	Tradename Decal	2	
29	079010-38	Wire Assembly	1		103886-01	General Information Decal	1	
30	103406-01	Regulator	1		099504-01	Warning Decal	2	
31	M51104-01	Handle	1		103021-01	Thermostat Decal	1	
32	M11084-29	Screw, #10-16 x 3/4"	2		103889-01	NG Warning Decal	1	



SPECIFICATIONS

Input Rating (Btu/Hr) 150,000

Fuel Natural Gas Only
Fuel Consumption 146 Cubic Feet/Hour
Supply Pressure To Heater Min: 5"WC Max: 1/2 psi
Internal Regulator Outlet Pressure 4" WC (Factory Preset)

Manifold Pressure 5" WC Hot Air Output (CFM Approx) 550

Motor 3,430 RPM, 1/8 HP Electric Input 120 V/60 Hz

Amperage 2.2

Ignition Direct Spark, Interrupted Type

Ignitor Gap (Inches) .13/.15

Weight (Pounds) Heater: 24 Shipping: 35 Size - L x W x H (Inches) 36 \(^{1}\sqrt{4}\) x 14 \(^{1}\sqrt{2}\) x 20

TECHNICAL SERVICE

You may have further questions about installation, operation, or troubleshooting. If so, contact DESA International's Technical Service Department at 1-866-672-6040. When calling please have your model and serial numbers of your heater ready.

You can also visit DESA International's technical services web site at www.desatech.com.

REPLACEMENT PARTS

▲ WARNING: Use only original replacement parts. This heater must use design-specific parts. Do not substitute or use generic parts. Improper replacement parts could cause serious or fatal injuries. This will also protect your warranty coverage for parts replaced under warranty.

PARTS UNDER WARRANTY

Contact authorized dealers of this product. If they can't supply original replacement part(s), either contact your nearest Parts Central or call DESA International's Technical Service Department at 1-866-672-6040. When calling DESA International, have ready:

- your name
- your address
- model and serial numbers of your heater
- · how heater was malfunctioning
- · purchase date

In most cases, we will ask you to return the part to the factory.

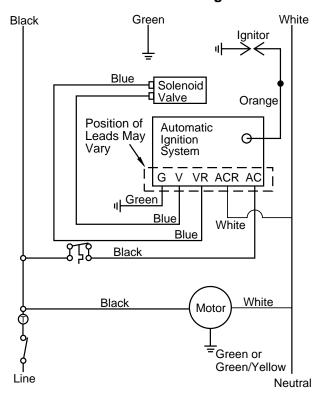
PARTS NOT UNDER WARRANTY

Contact authorized dealers of this product. If they can't supply original replacement part(s), either contact your nearest Parts Central or call DESA International at 1-866-672-6040. When calling DESA International, have ready:

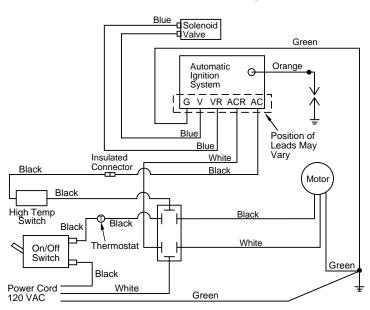
- model number of your heater
- the replacement part number

WIRING DIAGRAMS

Electrical Ladder Diagram



Electrical Connection Diagram



OWNER'S REGISTRATION FORM

⊢ r:	emplete registration form and rand:		-	-	ration at www.desatech.com with leater, Master, Remington, etc.)	n 30 d	ays after pur	chase.	
	odel:								
	te Purchased:			- , , , , , , , , , , , , , , , , , , ,					
	rial Number:								
	st Name:				me:				
								_	
	dress:							_	
	y:				Zip: Cou	ntry: _		_	
PΙ	ease answer the following ques	stions t	o register you	ur product	with DESA International:				
1.	Who will heater be used by? O	Individ	ual O Busine	ess					
2.	Will you use your heater in more	than or	ne location?	Yes ON	lo				
3.	Where will the product be used?	(You ma	ay select more	than one.)	O Workshop O Workshop O Barn) Resi	dential Constru	uction	
	O Commercial Construction O	Garage	e O Factory	O Recreati	on O Warehouse O Utility Shed/Ou	tbuildin	g		
	O Other	_	-		·		•		
4.	Cost of product (excluding sales			•					
5.					ice Center O Other				
6.		•	•		pe of product before going into the store				
		-		-	opane Dealer O Natural Gas/Utility C			or Ruilder's Supply	
۲.		•			•		nome Center	or builder's Supply	
					strial/Contractor Supply O Rental Sto				
•					N. 10 2K 2P 1		2.04		
8.					Natural Gas O Kerosene O Diesel				
9.	, , ,				r O Replace Older Model O D.I.Y. He		•	gency Back-Up Heat	
					tion Other				
10.					Relative or Friend O Co-Worker				
							(Cno	- 'C A	
	O Store Display O Previously	Owned	a Heater O	Other			(Spe	есту)	
					nington O All-Pro O Dayton O Univer				
	What other brands did you consi	der? O	None O Mas	ter O Ren		sal Ol	Mr. Heater O	L.B. White Tradesmar	
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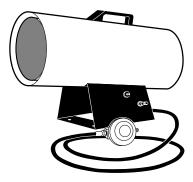
19. This question will allow us to better understand the demographic profile of our customers. Which of the following best describes you? (not required)

O African American O Asian American O Mexican O Puerto Rican O Cuban O Other Hispanic O White O Other ___

I F	Postage Required	



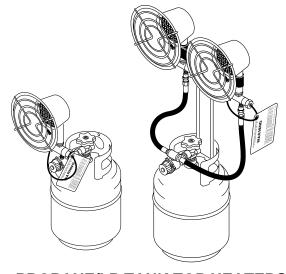
OTHER OUTDOOR HEATING PRODUCTS



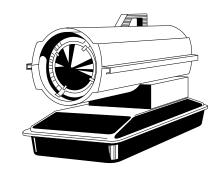
PROPANE/LP FORCED AIR HEATERS



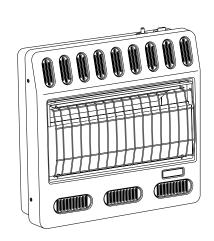
PROPANE/LP CONVECTION HEATERS



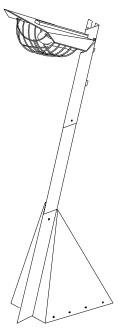
PROPANE/LP TANK TOP HEATERS



PORTABLE KEROSENE/DIESEL FORCED AIR HEATERS



PROPANE/LP AND NATURAL GAS GARAGE HEATERS



PROPANE/LP PATIO HEATERS



PROPANE/LP AND NATURAL GAS CHIMENEAS

WARRANTY AND REPAIR SERVICE

KEEP THIS WARRANTY

Model	
Serial No.	
Date of Purchase	

LIMITED WARRANTY

DESA International warrants this product and any parts thereof, to be free from defects in materials and workmanship for one (1) year from the date of first purchase when operated and maintained in accordance with instructions. This warranty is extended only to the original retail purchaser, when proof of purchase is provided.

This warranty covers only the cost of parts and labor required to restore the product to proper operating condition. Transportation and incidental costs associated with warranty repairs are not reimbursable under this warranty.

Warranty service is available only through authorized dealers and service centers.

This warranty does not cover defects resulting from misuse, abuse, negligence, accidents, lack of proper maintenance, normal wear, alteration, modification, tampering, contaminated fuels, repair using improper parts, or repair by anyone other than an authorized dealer or service center. Routine maintenance is the responsibility of the owner.

THIS EXPRESS WARRANTY IS GIVEN IN LIEU OF ANY OTHER WARRANTY EITHER EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

DESA International assumes no responsibility for indirect, incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, or limitations or exclusions may not apply to you. This Limited Warranty gives you specific legal rights and you may also have other rights which vary from state to state.

We reserve the right to amend these specifications at any time without notice. The only warranty applicable is our standard written warranty. We make no other warranty, expressed or implied.

WARRANTY SERVICE

Should your heater require service, return it to your nearest authorized service center. Proof of purchase must be presented with the heater. The heater will be inspected. A defect may be caused by faulty materials or workmanship. If so, DESA International will repair or replace the heater without charge.

REPAIR SERVICE

Return your heater to your nearest authorized service center. Repairs not covered by the warranty will be billed at standard prices. Each Service Center is independently owned and operated. We reserve the right to amend these specifications at any time without notice. When writing, always include model number and serial number. For information, write:

2701 Industrial Drive
P.O. Box 90004
Bowling Green, KY 42102-9004

ATTN: Customer Service Department



NOT A UPC

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